display panel to generate a light amount signal corresponding to the amount of collected ambient light; and

a control circuit electrically connected to the liquid crystal display panel and the light receiving device, wherein the control circuit varies the predetermined display characteristic in accordance with the light amount signal, and wherein the liquid crystal display panel includes a pair of substrates, and wherein the light receiving device is arranged facing the luminescent unit on one of the substrates and adjacent to a display area of the liquid crystal display panel.

C3 cont.

REMARKS/ARGUMENTS

Claims 3 through 5, 7 through 12, 16 through 19, and 22 through 31 are pending in this application. Claims 1, 2, 6, 14,15, 20 and 21 were cancelled in a previous amendment.

Amendments to the Claims

Applicants have made amendments to the claims. Attached hereto is a marked up version of the changes made to the specification and claims by the current amendment. The attached page is captioned **"Version With Markings to Show Changes Made**."

Section 103 Rejection

Applicants respectfully traverse the rejection of Claims 3 through 5, 7, 16 through 19, 30 and 31 as being unpatentable over Applicants Admitted Prior Art ("APA") in view of U.S. Patent No.

5,952,922 ("Helms") in view of U.S. Patent No. 6,195,140 ("Kubo"). To establish a prima facie case of obviousness under 35 U.S.C. § 103(a), the Examiner must show that 1) the references teach all of the elements of the claimed invention, 2) the references contain some teaching, suggestion or motivation to combine the references, and 3) the references suggest a reasonable expectation of success. Because the references cited by the Examiner do not teach all of the elements of the claimed invention, the prima facie elements of an obviousness rejection under 35 U.S.C. § 103(a) are not met.

The present invention is directed to a liquid crystal display apparatus that includes a control circuit for varying a predetermined display characteristic in accordance with the amount of the collected ambient light that is used as a backlight of the liquid crystal display panel. The apparatus also includes a light receiving device substantially countering an optical path of the ambient light collected by the liquid crystal display panel to generate a light amount signal corresponding to the amount of collected ambient light. Rejected independent claims 3, 7, 16 and 17 (as amended above) include all of the above features.

The Helms reference is directed to an LCD brightness control system that includes a photodetector (14) for detecting ambient light and a brightness control circuitry for controlling the brightness of the LCD panel. The Kubo reference discloses a liquid crystal display that includes a plurality of pixel regions each having a reflection region and a transmission region.

Neither the APA reference, the Kubo reference, or the Helms reference, alone or in combination, disclose a light receiving device substantially countering an optical path of the ambient light collected by the light collector and illuminating the *rear* surface of the liquid crystal display panel. The photodetector of Helms is disposed on the same side of the lid portion, which is

proximate to the front surface of the LCD panel to detect a level of ambient light which is directed toward the *front* of the LCD panel. The Helms reference does not teach one about the rear surface of the LCD panel or whether ambient light could be collected from the rear surface of the LCD panel. Thus, the Helms reference detects the ambient light directed at the *front* of the LCD panel and adjusts the brightness level of the LCD panel in response. In contrast, the present invention has a light receiving device that counters an optical path of the ambient light collected by the light collector and illuminating the *rear* surface of the LCD display panel. Thus, the present invention detects (and collects) the light received by the *rear* of the LCD panel.

The Kubo reference also does not disclose any light receiving devices that detect and collect ambient light from the rear of the LCD panel. The transmission regions and the pixel regions, in order to work as intended, must be disposed at the front of the LCD panel. Thus, the Kubo reference does not teach detecting or collecting ambient light from the rear of the LCD panel and cannot be modified in such a way as to teach the detection and collection of ambient light from the rear surface of the LCD panel.

As admitted by the Examiner, the APA does not expressly teach a light receiving device that substantially counters an optical path of the ambient light collected by the light collector and illuminates a rear surface of the liquid crystal display panel to detect the amount of collected ambient light. Thus, the combination of the APA reference, the Helms reference, and the Kubo reference does not teach the claimed invention, as claimed in amended Claims 3, 7, 16 and 17. The remainder of the rejected claims depend from either Claims 3, 7, 16 or 17. Because the remainder of the

rejected claims depend from non-obvious claims 3, 7, 16 or 17, the remainder of the claims are non-obvious as well and should be allowed.

With particular reference to Claim 16, the claim has been amended such that the light receiving device is arranged at the side of the liquid crystal display panel. This limitation serves to further differentiate the present invention from the Helms reference. If the photodetector of the Helms reference were located at the side of the LCD display panel, the Helms reference would not work and would be rendered unsatisfactory for its intended purpose. If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon,* 733 F. 2d 900 (Fed. Cir. 1984). Thus, the use of the Helms reference as a Section 103 reference is improper since the modification of the Helms reference as suggested by the Examiner would render the Helms reference unsatisfactory for its intended purpose.

Allowed Claims

Applicants thank the Examiner for the allowance of Claims 8 through 12 and 22 through 29.

It is requested that the Examiner review the annotated claims hereinbelow and specifically identify any of the amendments that the Examiner believes may be reasonably construed as being related to the statutory requirements for patentability, and that narrow the claim scope. For each such amendment identified by the Examiner, it is requested that the representative named below be granted an opportunity to address the Examiner's belief that the amendment was made for statutory reasons of patentability and for narrowing the claim. Based upon the foregoing, Applicants believe that all

pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

3. (Twice amended) A liquid crystal display apparatus comprising:

a liquid crystal display panel having a predetermined display characteristic;

a luminescent unit located adjacent to the liquid crystal display panel, wherein the luminescent unit includes a light collector, which collects ambient light, and a light source, wherein the collected ambient light is used as a backlight of the liquid crystal display panel;

a light receiving device substantially countering an optical path of the ambient light [directed toward] collected by the light collector and illuminating a rear surface of the liquid crystal display panel to detect the amount of collected ambient light [collected by the light collector]; and

a control circuit electrically connected to the liquid crystal display panel and the light receiving device, wherein the control circuit varies the predetermined display characteristic in accordance with the amount of the detected ambient light, wherein the predetermined display characteristic includes transmittance, the control circuit changing a minimum transmittance in accordance with the amount of collected ambient light, and wherein the liquid crystal display panel includes [an electrode] electrodes to which a voltage of a predetermined range is applied, wherein the control circuit shifts the predetermined voltage range in accordance with the amount of collected ambient light to thereby change the minimum transmittance.

7. (Twice Amended) A liquid crystal display apparatus comprising:

a liquid crystal display panel having a predetermined display characteristic;

a luminescent unit located adjacent to the liquid crystal display panel, wherein the luminescent unit includes a light collector, which collects ambient light, and a light source, wherein the collected ambient light is used as a backlight of the liquid crystal display panel;

a light receiving device substantially countering an optical path of the ambient light [directed toward] collected by the light collector and illuminating a rear surface of the liquid crystal display panel to detect the amount of collected ambient light [collected by the light collector]; and

a control circuit electrically connected to the liquid crystal display panel and the light receiving device, wherein the control circuit varies the predetermined display characteristic in accordance with the amount of the detected ambient light, wherein the predetermined display characteristic includes transmittance, the control circuit changing a minimum transmittance in accordance with the amount of collected ambient light, and wherein the liquid crystal display panel includes [an electrode] electrodes to which a voltage of a predetermined range is applied, and wherein the control circuit narrows the predetermined voltage range in order to decrease the contrast ratio when the amount of collected ambient light is equal to or greater than a predetermined value.

16. (Twice Amended) A liquid crystal display apparatus comprising:

a liquid crystal display panel having a predetermined display characteristic;

a luminescent unit located adjacent to the liquid crystal display panel for providing light to the display panel to illuminate the display panel, wherein the luminescent unit includes a light collector, which collects ambient light, and a light source, wherein the collected ambient light is used as a backlight of the liquid crystal display panel;

a light receiving device substantially countering an optical path of the ambient light [directed toward] collected by the light collector and illuminating a rear surface of the liquid crystal display panel to generate a light amount signal corresponding to the amount of collected ambient light [collected by the light collector]; and

a control circuit electrically connected to the liquid crystal display panel and the light receiving device, wherein the control circuit varies the predetermined display characteristic in accordance with the light amount signal, and wherein the liquid crystal display panel includes:

first and second substrates;

a liquid crystal layer arranged between the first and second substrates; and

a sealed portion for sealing the liquid crystal layer and defining a peripheral area and a display area of the liquid crystal display panel, wherein the light receiving device is formed on one of the facing surfaces of the first and second substrates in the peripheral area and is arranged [adjacent to the display area] at a side of the liquid crystal display panel.

17. (Twice Amended) A liquid crystal display apparatus comprising:

a liquid crystal display panel having a predetermined display characteristic;

a luminescent unit located adjacent to the liquid crystal display panel for providing light to the display panel to illuminate the display panel, wherein the luminescent unit includes a light collector, which collects ambient light, and a light source, wherein the collected ambient light is used as a backlight of the liquid crystal display panel;

a light receiving device substantially countering an optical path of the ambient light [directed toward] collected by the light collector and illuminating a rear surface of the liquid crystal display panel to generate a light amount signal corresponding to the amount of collected ambient light [collected by the light collector]; and

a control circuit electrically connected to the liquid crystal display panel and the light receiving device, wherein the control circuit varies the predetermined display characteristic in accordance with the light amount signal, and wherein the liquid crystal display panel includes a pair of substrates, and wherein the light receiving device is arranged facing the luminescent unit on one of the substrates and adjacent to a display area of the liquid crystal display panel.